Overview of Virginia's Proposed Nutrient Criteria for Lakes/Reservoirs

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Aquatic Life Use Impairment Study
for the Occoquan Reservoir

Public Meeting
Thursday, September 7, 2006

Current Water Quality Standards

- There are currently no water quality standards established in Virginia for nutrients (such as nitrogen and phosphorus) in lakes and reservoirs.
- EPA requires all states to develop nutrient criteria as part of their water quality standards. If the state does not develop their own criteria, EPA will establish standards for the following criteria:
  - Total Nitrogen (TN)
  - Total Phosphorus (TP)
  - Chlorophyll *a*
  - Turbidity
- Virginia submitted a "Nutrient Criteria Development Plan for Virginia" to EPA.
- EPA approved the plan in June 2004.
- Plan involves a staggered schedule for developing nutrient criteria by type of waterbody (estuarine, lakes/reservoirs, rivers and streams)

Criteria Development for Lakes and Reservoirs

- **Recommendations for criteria development came from an Academic Advisory Committee (AAC).**
- **The AAC consisted of scientists from several Virginia colleges and universities.**
- **Proposed criteria underwent a public comment period in early 2006**
- **State Water Control Board formally adopted the amendments on June 1, 2006.**
- **November 2006: Criteria will be submitted to EPA for 60-90 day review and approval**
- **First Quarter of 2007: Expected effective date of the amendments.**

Criteria for Lakes and Reservoirs

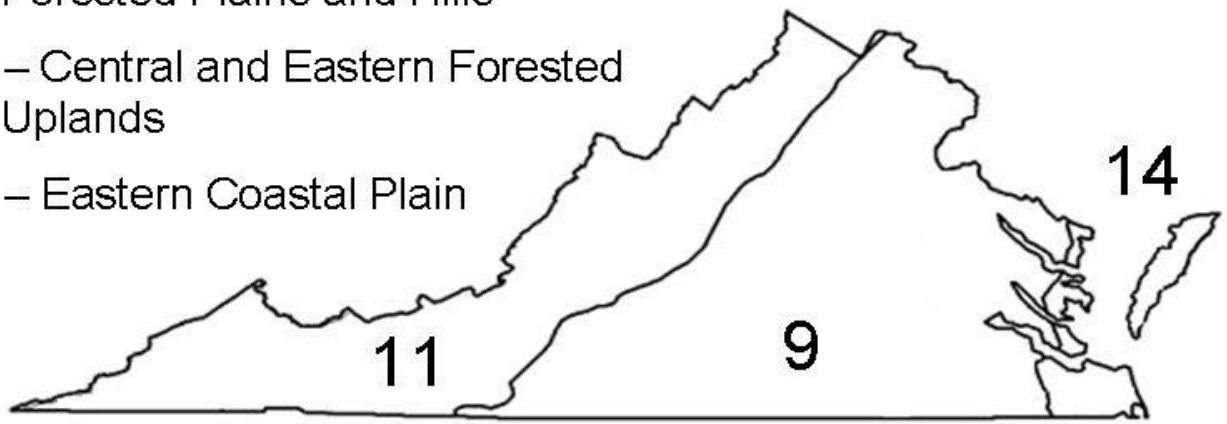
Numerical Criteria Based on Fishery Type & Ecoregion

- **Evaluated from April to October**
- **Different criteria established for lakes/reservoirs depending on their Fishery Type and Ecoregion.**
- **Established Standards for:**
  - **Chlorophyll *a***
  - **Total Phosphorus (when documented use of algicides during the April – October monitoring period)**
  - **Dissolved Oxygen (4 mg/l min, 5 mg/l daily average) only for upper layer (epilimnion) during thermal stratification**

9 - Southeastern Temperate Forested Plains and Hills

11 – Central and Eastern Forested Uplands

14 – Eastern Coastal Plain

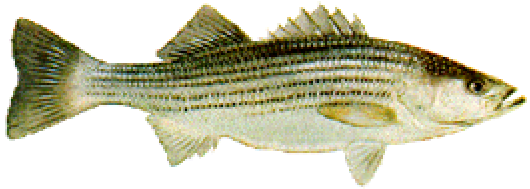


How Criteria were Developed

- **AAC wanted to determine the maximum Nutrient Concentrations (TP and Chlorophyll *a* levels) that can sustain good to excellent recreational fisheries.**
- **Status of recreational fishery in each impoundment rated on a scale of 1 (poor) to 5 (excellent) by VDGIF biologists, in response to requests of the AAC.**
- **Each reservoir was classified as one of the following types based on the professional knowledge of Dr. John Ney and considering VDGIF's biologists' comments during the rating process.**
  - **Coolwater Fisheries**
  - **Coldwater (Trout) Fisheries**
  - **Fertilized Fisheries**
  - **Warmwater Fisheries**
  - **Other (Affected by unique or unusual conditions that make them poor predictors of how the state's lakes could be expected to respond to water-column nutrients)**

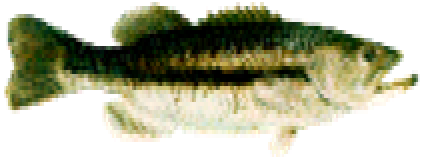
Criteria for Lakes and Reservoirs in Ecoregion 9

Coolwater Fisheries



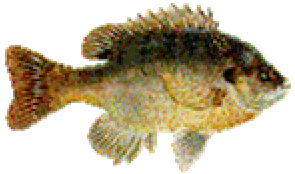
Chl-a = 25 ug/L
TP = 30 ug/ l

Warmwater Fisheries



Chl-a = 35 ug/L
TP = 40 ug/ l

Fertilized Lakes



Chl-a = 60 ug/L
TP = 40 ug/ l

*****The Occoquan Reservoir is classified as a Warmwater Fishery in Ecoregion 9***

Assessment:

- **Water quality assessment of the nutrient criteria (chlorophyll *a* and total phosphorus) will be based on the two most recent monitoring years with available data.**

Development of Reservoir Specific Criteria

- **Added a confirmation step for reservoirs listed in Section 187 - consultation with Virginia Department of Game and Inland Fisheries (DGIF) to determine whether the designated recreational fishery use of the water is being attained when the numeric nutrient criteria are exceeded.**

- **Where the criteria are exceeded and the designated uses of the water body are being attained, the water will still be considered impaired until site-specific criteria are adopted and become effective in order to remove the water body from the impaired waters list.**

Consultation Process with VDGIF

- **When DEQ determines that the applicable nutrient criteria in Section 187 B of the water quality standards regulation for a specific man-made lake or reservoir are exceeded, the DEQ central office water quality standards program coordinator will contact the VDGIF Regional Fisheries Manager regarding the status of the fishery in determining whether or not the designated use for that water body is currently being attained.**

- **Since the nutrient criteria for impoundments were developed using water chemistry data from those reservoirs where VDGIF biologists rated the fishery as good or excellent, documentation should support this level of fishery.**

- **Appropriate documentation for confirmation of maintenance of the designated fishery use would include the most recent information available on:**
  - **catch per unit effort of specific size classes of managed fish populations**
  - **population size structure**
  - **observations or records regarding changes in fishing use or general trends in community structure**

DEQ Action After Consultation with VDGIF

- **If the designated use of the subject water body is not being attained, the board shall assess the water body as impaired in accordance with § 62.1-44.19.5 of the Code of Virginia.**

- **If the designated use is being attained, the board shall assess the water body as impaired in accordance with § 62.1-44.19.5 of the Code of Virginia until site-specific criteria are adopted and become effective for that water body.**

- **Regulatory Adoption of Amendments to the Water Quality Standards Regulation generally takes 18 - 24 Months.**

Implementation Guidance

- **Implementation Guidance for the Nutrient Criteria are currently under development.**

- **A Draft of the guidance is available on the DEQ web site:**

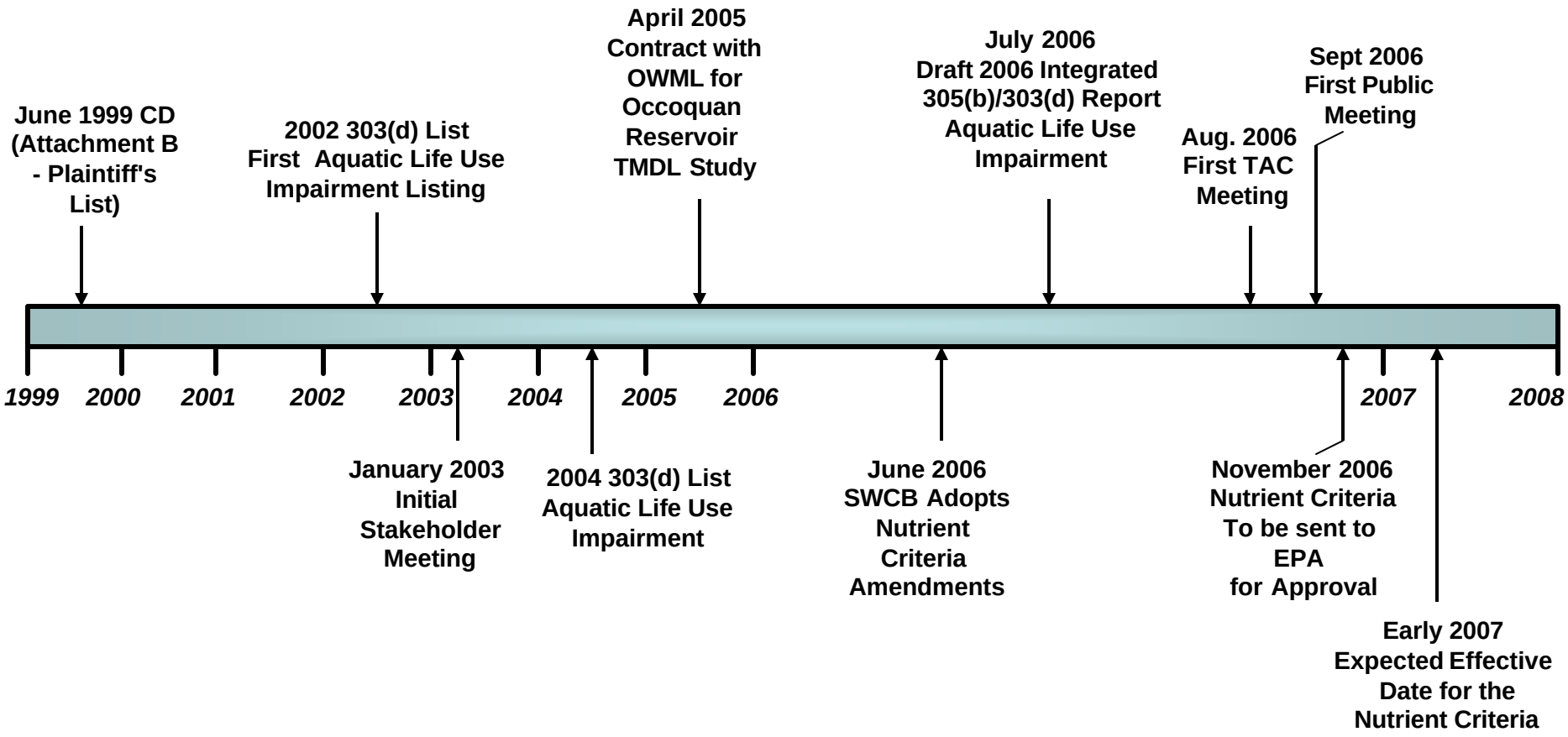
  http://www.deq.virginia.gov/wqs/documents/LAKEGUIDANCE_002.pdf

- **The Guidance will be final by the effective date of amendments (planned for early 2007).**

Where do we go from here?

Occoquan Reservoir Aquatic Life Use Impairment

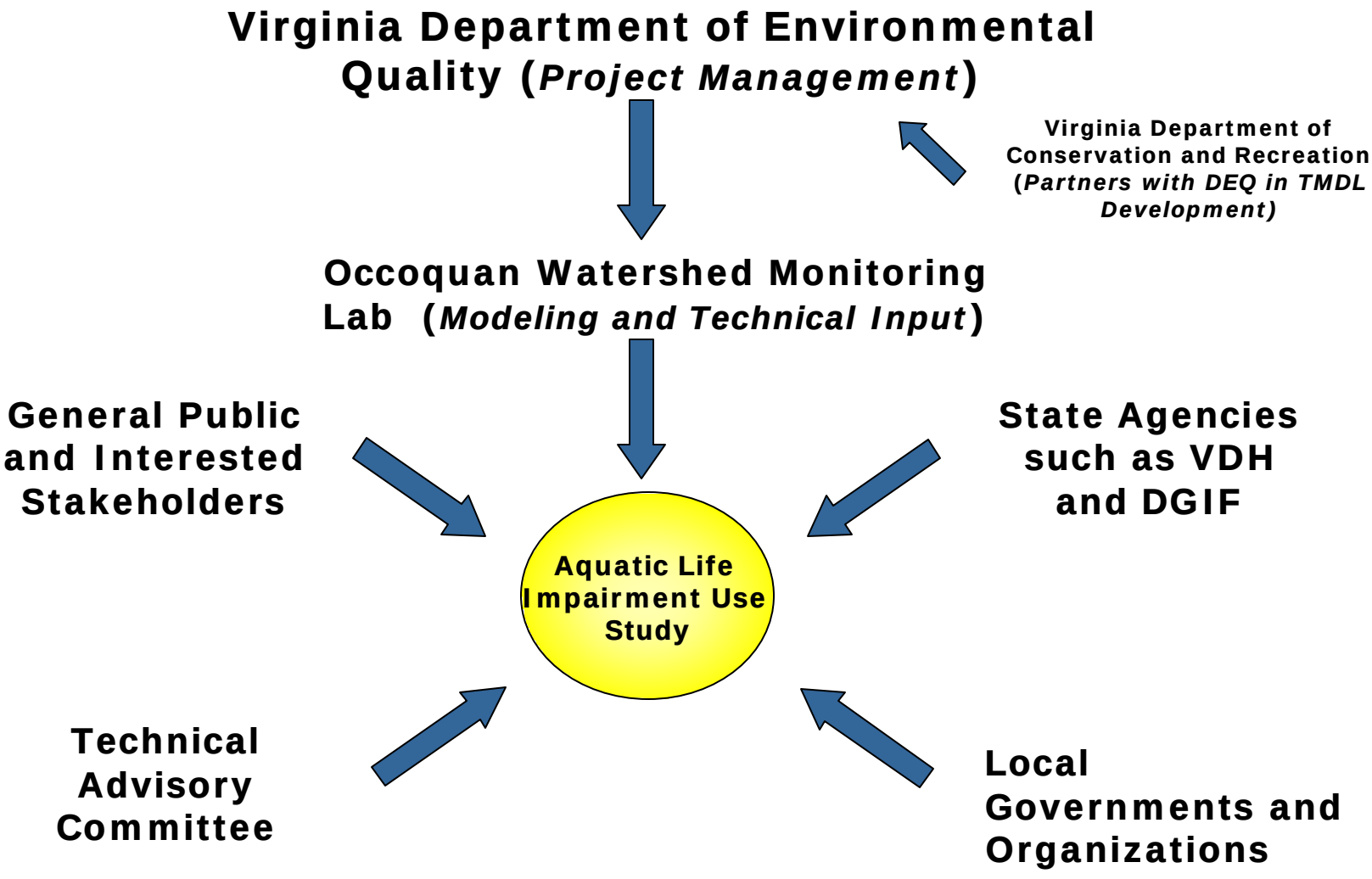
Project Milestones



Next Steps

- **New Nutrient Criteria should become effective in early 2007.**
- **Once new criteria are effective, evaluate the available data for the Occoquan Reservoir, to determine if the Reservoir is impaired for any of the new criteria.**
- **Determine whether a Total Maximum Daily Load (TMDL) Study is necessary for any of the new criteria.**
- **Evaluate the Dissolved Oxygen Impairment in the Occoquan Reservoir. Determine if an impairment still exists. If so, proceed with the TMDL Process. If not, receive EPA approval for delisting the Reservoir.**

How a TMDL Study is Managed



What is a TMDL?

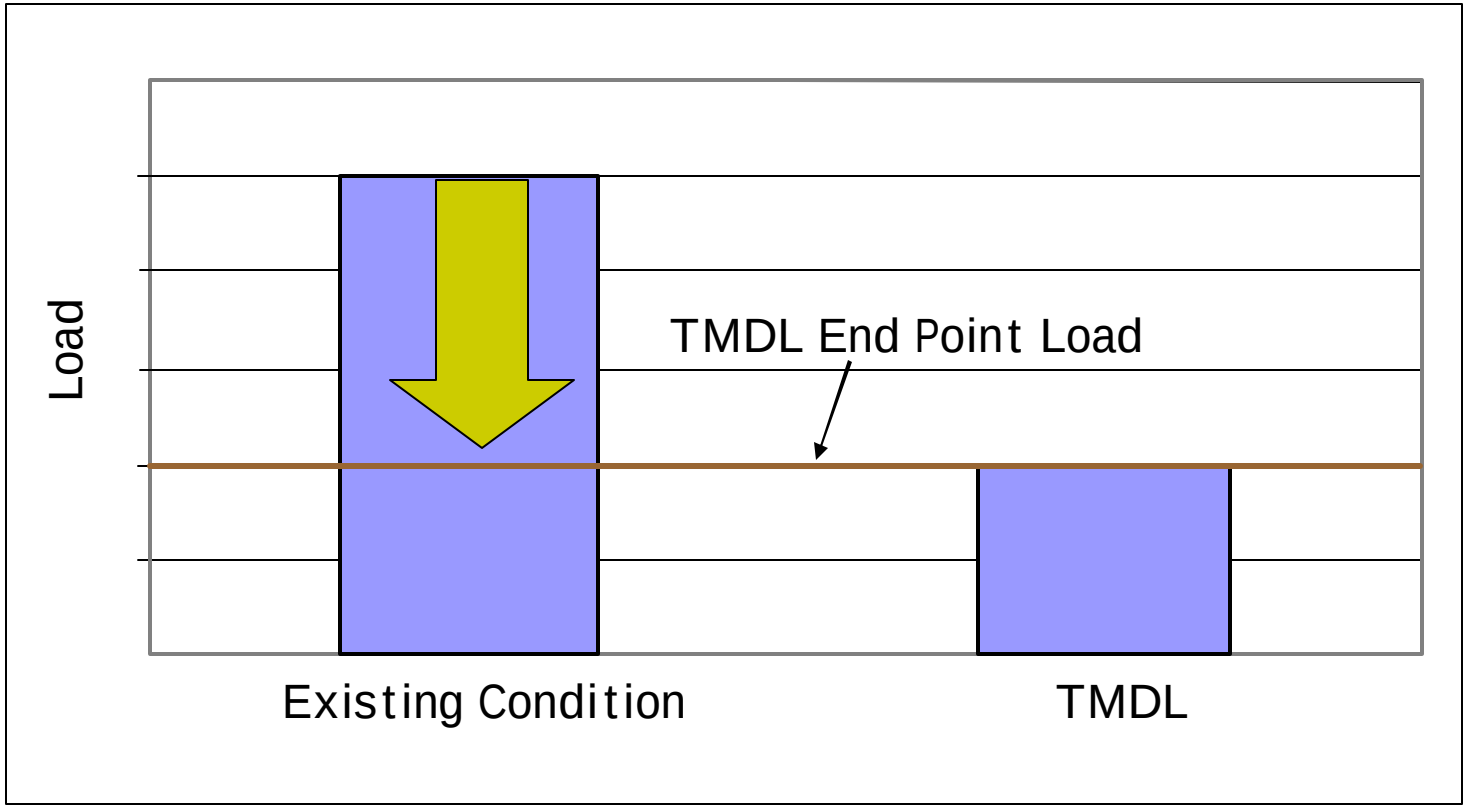
Total Maximum Daily Load (TMDL) is defined as the amount of a pollutant a stream can receive and still meet WQS. It is a pollution budget:

TMDL = Sum of WLA + Sum of LA + MOS

Where:

TMDL = Total Maximum Daily Load
WLA = Waste Load Allocation (point sources)
LA = Load Allocation (nonpoint sources)
MOS = Margin of Safety

An Example TMDL



Reducing pollutant load to the TMDL end point load is expected to restore water quality.

Required Elements of a TMDL

A TMDL must:

- **Be developed to meet Water Quality Standards.**
- **Be developed for critical stream conditions.**
- **Consider seasonal variations.**
- **Consider impacts of background contributions.**
- **Include wasteload and load allocations (WLA, LA).**
- **Include a margin of safety (MOS).**
- **Be subject to public participation.**
- **Provide reasonable assurance of implementation.**

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Questions ?